Algebra Pre-Assessment Name _____

Write the letter of the set in the blank next to the corresponding term:

____ Integer	a. $\{1, 2, 3, 4, 5, 6, \cdots\}$
____ Natural	b. $\{0, 1, 2, 3, 4, 5, 6 \cdots\}$
____ Rational	c. $\{\cdots -3, -2, -1, 0, 1, 2, 3, \cdots\}$
____ Irrational	d. $\left\{\frac{a}{b}: for\ all\ integers\ a\ and\ b\ (b \neq 0)\right\}$
____ Non-negative	e. $\{\cdots, 1.4142135\ldots, 2.7182818\ldots, 3.1415926\ldots, \cdots\}$

Perform the following operations with integers:

$$\begin{array}{r} 213 \\ +188 \\ \hline \end{array} \qquad -8-(-5)= \qquad 14(-12)= \qquad 180 \div 5 =$$

Perform the following operations with fractions:

$$\frac{2}{5}+\frac{7}{5}= \qquad \frac{2}{3}-\frac{1}{2}= \qquad \frac{4}{3}\cdot\frac{5}{6}= \qquad \frac{6}{5}\div\frac{1}{3}=$$

Simplify these expressions as far as possible:

$$36-4(2^2+3) \qquad 4(3+2x)-6(5-x) \qquad -3y+6<18$$

Evaluate this expression using the given values: $2x+y^2$ if $x=3$ and $y=-4$

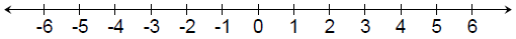
Circle "T" if the statement is true (valid) or "F" if the statement is false (not valid):

T F	$3^4=64$	T F	$\frac{24}{14}=1\frac{5}{6}$
T F	$\lvert -5\rvert > 0$	T F	$\frac{18}{25}=60\%$
T F	38 is an *odd* number	T F	$0.002=2\times10^3$
T F	51 is a *prime* number	T F	$\frac{1}{3}=0.33\overline{3}$
T F	$\frac{0}{k}=0$, for any $k\neq0$	T F	$(a-b)-c=a-(b-c)$, for any a, b, c

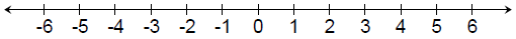
Algebra Pre-Assessment (page 2)

Draw each interval on the number-line provided:

$(0, 5]$



$-5x - 4 \geq 11$



Simplify the following expressions as far as possible:

$(2^3)^2$ $\quad$ $\frac{3^7}{3^5}$ $\quad$ $(2x^2 + 5x) - (3x + 7)$ $\quad$ $\frac{ab^{-3}}{a^4b^2}$

Expand the following polynomials and combine similar terms:

$5(3a - 8)$ $\quad$ $(b + 1)^3$ $\quad$ $(2c - 3)(c^2 + 2c - 5)$

Factor the following polynomials into two binomials that will be of the form (_____)(_____):

$x^2 + 6x + 8$ $\quad$ $3y^2 + 14y - 5$ $\quad$ $2xy - 8y + 3x - 12$

Circle the letter (a,b,c,d, e) that corresponds to the one correct response:

$\sqrt{2} \cdot \sqrt{8}$ =_____?

a. $\sqrt{10}$
b. $2\sqrt{2}$
c. 4
d. $1/4$
e. none of the above

$3i(2 - 5i)$ =_____?
where $i = \sqrt{-1}$

a. $-9i$
b. $6i - 15$
c. $15 + 6i$
d. -9
e. none of the above

$\log_{10}(4) = d$
can also be expressed as _____?

a. $10^d = 4$
b. $4^d = 10$
c. $\ln 4 = d$
d. $e^{10} = 4d$
e. none of the above

Algebra Pre-Assessment (page 3)

If $f(a) = -a^2$ and $g(b) = 3b$, the function $fog = f[g(b)] =$ _____ and $fog(2) =$ _____.

Find the slope of the following lines.

$y_1 = -5x$ $\quad$ $4x + y_2 = 0$ $\quad$ $-2y_3 = 8x - 8$

Indicate if any of these lines (y_1, y_2, y_3) are parallel or perpendicular: _____

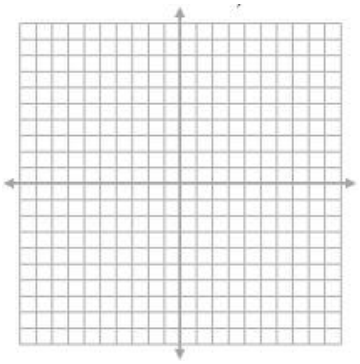
Find the slope between these two points, and graph the line:

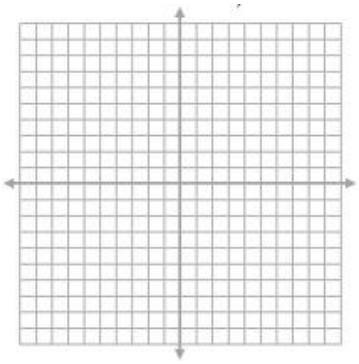
$(-2, 6)$ $\quad$ $(4, 3)$

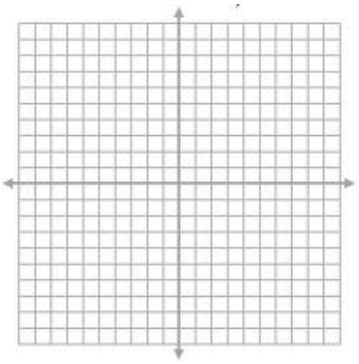
Find the x- and y-intercept(s), then graph the line:

$2x + 3y = -6$

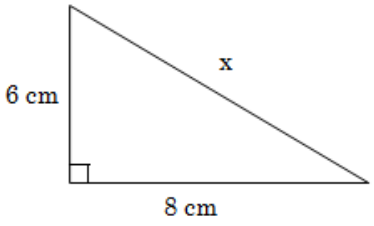
Write the equation of the line with the point $(-2, 4)$ and with a slope of $-\frac{3}{4}$, and graph:



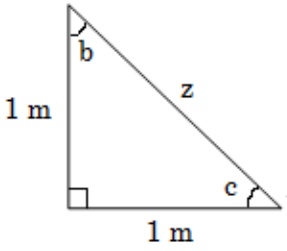




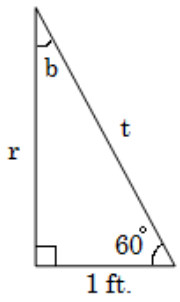
Find the length of x:



Find the length of z:
and the angle measure of b:
and the angle measure of c:



Find the angle of b:
and the length of t:
and the length of r:



Algebra Pre-Assessment (page 4)

Write the letter of each graph in the blank next to the corresponding function:

_____ $f(x) = 2\sin(x)$

_____ $f(x) = 2\cos(x)$

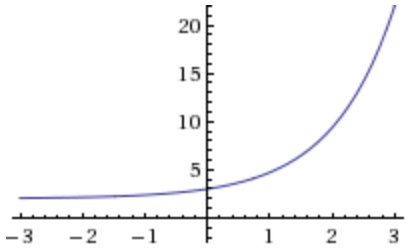
_____ $f(x) = \tan(x)$

_____ $f(x) = x^3 + 2$

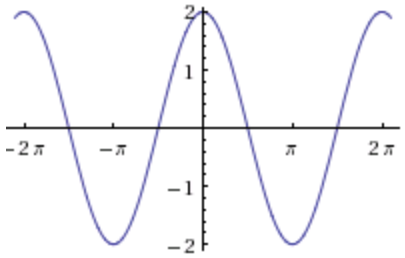
_____ $f(x) = e^x + 2$

_____ $f(x) = \ln(x) + 2$

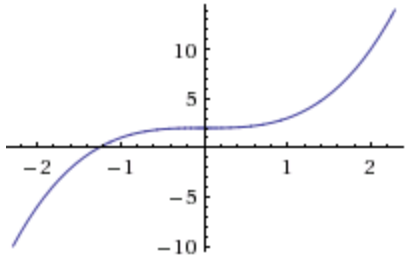
(a)



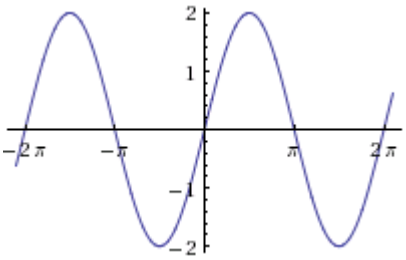
(b)



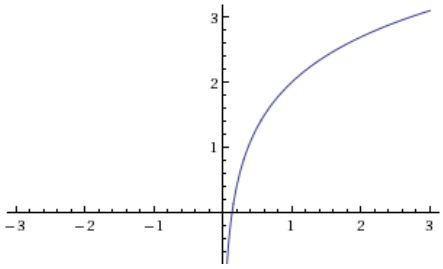
(c)



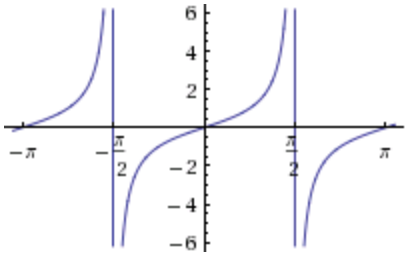
(d)



(e)

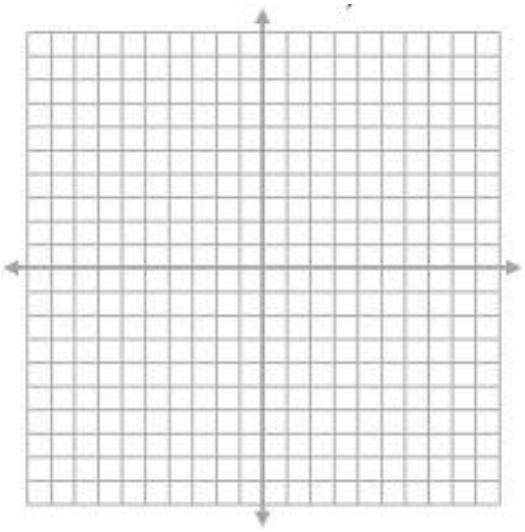


(f)

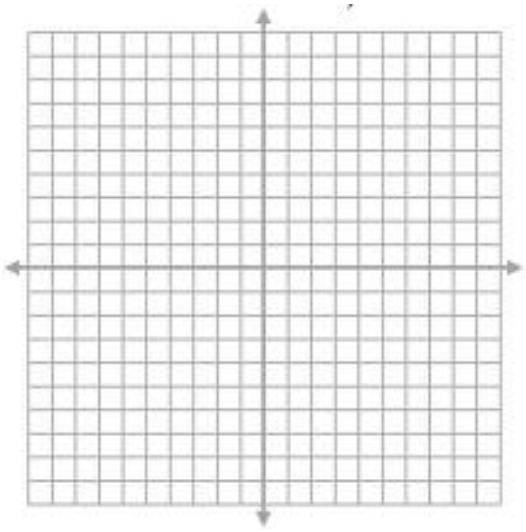


Draw the appropriate graph on the coordinate plane provided:

$g(x) = -x^2 + 4$



$(x-3)^2 + (y+2)^2 = 25$



Algebra Pre-Assessment (page 5)

Translate the following numerical expression into an English statement:
(Example: $2 \cdot y \leq 8$ could be written as "Two y is less than or equal to eight")

$6x^2 - 5x - 4 = 0$ _____

_____

(For extra credit, solve the above quadratic equation for x)

What values of x and y (and z) make the following system of equations true?

$$2x - y = 6$$
$$y + 2 = x$$

$$2x - 5y + 3z = -1$$
$$x + 4y - 2z = 9$$
$$x - 2y - 4z = -5$$

Translate each verbal phrase into a numerical expression and solve the problem:

- "To pass algebra, a student must have an exam average of at least 70%. On the first four exams, a student received scores of 82%, 75%, 59%, and 73%. What possible percentages on the final exam would give the student a sufficiently high exam average?

- "A soccer field has a perimeter of 320 meters. The length between the two goals is 40 meters more than the width between sidelines. What are the dimensions of this soccer field?"